Examination: Management Accounting (5075) **Winter semester: 2002/03**
Examiners: Prof. Luhmer and Prof. Erichson

Candidate: Last name: First name:

Matriculation Number:

For use of examiner only →	1	2	3	4	5	6	Σ	Grade

The following aids can be used: calculator, English language dictionary

Hint: A total of 120 points can be achieved. For each problem 20 points are achievable. You are advised to base your time allocation on these points.

Please enter your answers in the space provided in these sheets and return for grading. Only answers in these sheets will be considered.

All of the following 6 problems are to be solved.

Problems:

1. ***ABC versus traditional Costing system:*** A company has two departments: procurement and production. The existing cost system treats procurement costs as overhead costs and allocates them according to direct material costs. Procurement costs were 1200 in March while production overhead cost amounted to 1800. Production overhead is allocated using machine hrs. General and administrative (G&A) costs are fixed and amounted to 800. The traditional cost system allocates them on the basis of revenue. Two customers A and B were served in March:

	A	B
Revenue	6000	4000
Direct costs		
Direct material	2000	1000
Direct labor	1200	600
Machine hrs.	400	400

The company considers introducing ***ABC*** and has figured out that procurement cost is driven by the number of orders to be processed in the procurement department. Customer A caused 100 procurement orders, customer B 300. Half of the production overhead costs are inspection costs, driven by the number of production lots. Customer A received 4 lots, customer B received 8 lots. ABC adds G&A costs to the cost pools of the activities proportionally to the size of the pools.

Required:
Calculate the cost allocated to the two customers
a) by the existing costing system
b) by the ABC system.
c) Assume half of the machine-hr. related production overhead is fixed depreciation, and 80% of the activity-related procurement costs and all the inspection costs are long-run committed salary. What is the contribution margin of each customer over flexible cost?
d) Which of the two customers seems to be more profitable according to each of the three costing systems? What system's results are informative for management? For which purposes?

Fill in your numerical answers in the following tables on the following next page.

a)	Customer A	Customer B
Direct cost	*3200*	*1600*
Production overhead *1800 1:1*	*900*	*900*
Procurement cost *1200 2:1*	*800*	*400*
G&A *840; 6:4*	*504*	*336*
Total allocated cost	*5404*	*3236*

Charge Percentage for G&A to activity cost pools:

b)	Customer A	Customer B
Direct cost	*3200*	*1600*
Production overhead *machine hr.-related* *inspection cost* *900 + 40% G&A* *= 1260*	*450* *420*	*450* *840*
Procurement cost *1200 + 40% G&A* *= 1680*	*420*	*1260*
Total allocated cost	*4490*	*4150*

c)	Customer A	Customer B
Direct cost	*3200*	*1600*
Production overhead	*225*	*225*
Procurement cost *240; 1 : 2*	*80*	*160*
Flexible Cost	*3505*	*1985*
Contribution Margin	*2495*	*2015*

d) *Customer A appears to be less profitable under the existing cost system, while B yields a loss under ABC but quite a reasonable contribution over flexible cost. Both ABC and the contribution are informative for management, ABC for long-run, the contribution over flexible cost for short-run decision purposes. The existing system is not informative because it allocates cost in a discretionary way.*

2. ***Variance Analysis:*** Littrell Company produces chairs and has determined the following direct cost categories and budgeted amounts:

Category	Standard Inputs for 1 output	Standard Cost per input
Direct Materials	1.00	$7.50
Direct Labor	0.30	9.00
Direct Marketing	0.50	3.00

Actual performance for the company is shown below:

Actual output: (in units)	4,000
Direct Materials:	
Materials costs	$30,225
Input purchased and used	3,900
Actual price per input	$7.75
Direct Manufacturing Labor:	
Labor costs	$11,470
Labor-hours of input	1,240
Actual price per hour	$9.25
Direct Marketing Labor:	
Labor costs	$5,880
Labor-hours of input	2,100
Actual price per hour	$2.80

Required:

a. the combined total of the flexible-budget variances (Use the form below)

	Actual Results	Flexible Budget	Variances
Direct materials	$30,225	$30,000	$225 U
Direct manufacturing labor	11,470	10,800	670 U
Direct marketing labor	5,880	6,000	120 F
	$47,575	$46,800	$775 U

b. What is the price variance of the direct materials?

($7.75 - $7.50) x (3,900) = $975 unfavorable

c. What is the price variance of the direct manufacturing labor and the direct marketing labor, respectively?

Manufacturing Labor: ($9.25 - $9.00) x 1,240 = $310 unfavorable

Marketing Labor: ($2.80 - $3.00) x 2,100 = $420 favorable

d. What is the efficiency variance for direct materials?

[3,900 - (4,000 units x 1.00)] x $7.50 = $750 favorable

e. What are the efficiency variances for direct manufacturing labor and direct marketing labor, respectively?

Manufacturing Labor: [1,240 hours - (4,000 x 0.30 hours)] x $9.00 = $360 U

Marketing Labor: [2,100 hours - (4,000 x 0.50 hours)] x $3.00 = $300.00 U

*3. **Break-even Analysis.*** Ballpark Concessions currently sells hot dogs. During a typical month, the stand reports a profit of $9,000 with sales of $50,000, fixed costs of $21,000, and variable costs of $0.64 per hot dog.

Required:

a. Determine the monthly breakeven sales in dollars before adding nachos.

Answer:

Contribution margin = Fixed costs + Profit
= $21,000 + $9,000 = $30,000

Variable costs = Sales - Contribution margin
= $50,000 - $30,000
= $20,000

Units sold = $20,000/$0.64 = 31,250 units
Selling price = $50,000/31,250 = $1.60 per unit
N = Breakeven units

$1.60N - $0.64N - $21,000 = 0
$0.96N - $21,000 = 0
N = $21,000/$0.96 = 21,875 units

Continuation of problem 3:

b. Next year, the company plans to start selling nachos for $3 per unit. Nachos will have a variable cost of $0.72 and new equipment and personnel to produce nachos will increase monthly fixed costs by $8,808.

Determine the monthly breakeven sales during the first year of nachos sales, assuming a constant sales mix of 1 hotdog and 2 units of nachos.

Answer:

Ratio equal to 1 hot dog to 2 units of nachos.

N = Breakeven number of units of hot dogs
2N = Breakeven number of units of nachos

$3(2)N + $1.60N - $0.72(2N) - $0.64N - $29,808 = 0
$7.60N - $2.08N - $29,808 = 0
N = $29,808/$5.52 = 5,400 hot dogs

Therefore, 5,400 hot dogs and 10,800 units of nachos need to be sold to break even.

4. ***Reciprocal method of service department cost allocation.***

Crisp Rolls Co. has two service departments: Maintenance and Motor pool. The maintenance department delivers 200 maintenance hours per month to the operating departments and another 200 hours to the motor pool. The cost of the maintenance department before allocation of service department costs is €35 000. Operating departments' usage of the motor pool is 56 000 miles per month. The maintenance department uses 4000 miles per month and the motor pool itself uses 1500 miles per month. Budgeted costs of the motor pool before allocated service department costs amount to €26 000.

Equation system:

$C_1 = 400\ q_1 = 35.000 + 4000\ q_2$ $\quad 400\ q_1 - 4000\ q_2 = 35.000$

$C_2 = 61500\ q_2 = 26.000 + 1500\ q_2 + 200\ q_1$ $\quad -200\ q_1 + 60000\ q_2 = 26.000$

Charge rates:

$q_1 = 95$ $\qquad$ $q_2 = 0.75$

5. ***Evaluating Strategy***. Following a strategy of product differentiation, Ernsting Corporation makes a high-end computer monitor, CM12. Ernsting Corporation presents the following data for the years 2001 and 2002:

	2001	2002
Units of CM12 produced and sold	5,000	5,500
Selling price	$400	$440
Direct materials (pounds)	15,000	15,375
Direct materials costs per pound	$40	$44
Manufacturing capacity for CM12 (units)	10,000	10,000
Conversion costs	$1,000,000	$1,100,000
Conversion costs per unit of capacity	$100	$110
Selling and customer-service capacity (customers)	60	58
Total selling and customer-service costs	$360,000	$362,500
Selling and customer-service capacity cost per customer	$6,000	$6,250

Ernsting Corporation produces no defective units but it wants to reduce direct materials usage per unit of CM12 in 2002. Manufacturing conversion costs in each year depend on production capacity defined in terms of CM12 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Ernsting Corporation has 46 customers in 2001 and 50 customers in 2002. The industry market size for high-end computer monitors increased 5% from 2001 to 2002.

Required:

a. Revenue effect of the price-recovery component?

($440 - $400) x 5,500 = $220,000 F

b. Cost effect of the price-recovery component?

Material qty in 2002: 15,000 x 5,500 / 5,000 = 16,500;

[($44 - $40) x 16,500] + [($110 - $100) x 10,000] + [($6,250 - $6,000) x 60] = $181,000 U

c. Net effect on operating income as a result of the productivity component?

15,000 x 5,500 / 5,000 = 16,500;

[(15,375 - 16,500) x $44] + [(10,000 - 10,000) x $110] + [(58 - 60) x 6,250] = $62,000 F

6. Variable costing versus absorption costing: Megredy Company prepared the following absorption-costing income statement for the year ended May 31, 2002.

Sales (16,000 units)	$320,000
Cost of goods sold	216,000
Gross margin	$104,000
Selling and administrative expenses	46,000
Operating income	$ 58,000

Additional information follows:

Selling and administrative expenses include $1.50 of variable cost per unit sold. There was no beginning inventory, and 17,500 units were produced. Variable manufacturing costs were $11 per unit. Actual fixed costs were equal to budgeted fixed costs. Normal capacity utilization is 20,000 units.

Required:

a) Prepare a variable-costing income statement for the same period.

Answer:

Sales		$320,000
Variable expenses:		
Manufacturing cost of goods sold[1]	$176,000	
Selling and administrative[2]	24,000	200,000
Contribution margin		$ 120,000
Fixed expenses:		
Fixed factory overhead[3]	$43,750	
Fixed selling and administrative[4]	22,000	65,750
Operating income		$ 54,250

1 16,000 units x $11 = $176,000
2 16,000 units x $1.50 = $24,000
3 [($216,000/16,000 units) - $11] x 17,500 units = $43,750
4 $46,000 - $24,000 = $22,000

b) Use an adequate denominator-level to determine the absorption cost-based value of finished goods inventory ending May 2002.

$$1{,}500 \times (11 + 43{,}750/20{,}000) = 19{,}781$$